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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/559,403	04/26/2000	Yong Beom Kim	0214-0166P-SP	1204

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Birch Stewart Kolasch & Birch LLP
PO Box 747
Falls Church, VA 22040-0747

EXAMINER	
NGUYEN, HOAN C	
ART UNIT	PAPER NUMBER
2871	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/559,403	KIM, YONG BEOM	
	Examiner	Art Unit	
	HOAN C. NGUYEN	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 July 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-10,23,24,26 and 28-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-10,23,24,26 and 28-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's arguments with respect to claims 1, 7, 23 based on the Response filed on 07/30/2007 have been considered but are moot in view of the new ground(s) of rejection. Therefore, this is Final action.

Claims 4, 11-22, 25 and 27 are canceled.

In the same as last office action, the pixel electrode of Kubo (Fig. 21) can be modify into the pattern of the pixel electrode of Kim (Fig. 6) regardless the pixel electrode is transparent or reflective.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-3, 5-6, 23-24, 26, 28 and 30 are rejected under 35 U.S.C. 103(a) as being obvious over Kubo et al. (US6295109B1) in view of Kim et al. (US2001/0046000A1) and Faris (US6133980A).

In regard to claims 1-2, 6 and 23, 24 and 26, Kubo et al. teach (Figs. 2-3 and 21-22) a transmission - reflection type liquid crystal display device comprising:

- a first transparent substrate 1;
- a second transparent substrate-2,
- a liquid crystal layer 5 between the first transparent substrate and the second transparent substrate;
- a linear polarizer 9 on the second transparent substrate;
- a circular polarizer (λ/4 wave plate 7) on an outer side of the first transparent substrate 1 according to claims 24 and 26;
- a reflecting film (reflective electrode 61 region 3R) on an inner side of the first transparent substrate adjacent to the liquid crystal layer, **the reflecting film 61 functioning as pixel electrode** and defining a light-transmitting region (transmissive electrode region 8T), wherein, as Fig. 21 shown, the light transmitting region disposed between an inner edge of a gate line and a side of outer edge periphery of the reflection film 61 in each pixel, an opposing side of said of reflecting film overlapping an adjacent gate line substantially.
- a λ/4 phase shift plate (λ/4 wave plate 10) between the linear polarizer 9 and the liquid crystal layer or second substrate 2; thus a circular polarizer (polarizer 9 and λ/4 wave plate 10) between the first substrate 1 and the backlight (col. 1 lines 30-35) according to claim 2.
- a transparent common electrode (transmisive electrode 4) between the linear polarizer 6 and the liquid crystal layer according to claim 6.

wherein

Claim 3:

- when a voltage is not impressed on the liquid crystal layer, the liquid crystal layer imparts or grants a phase shift of $\lambda/4$ to light transmitted through the liquid crystal layer since the retardation of liquid crystal 5 is zero when no voltage is applied (col. 10, lines 11-13).

Claim 5:

- a color filter on the reflective and transmissive electrode regions (col. 25 lines 55-58), thereby between the linear polarizer and the liquid crystal layer.

Claims 28 and 30:

- the reflection electrode 61 made of aluminum considers as the pixel electrode

However, Kobo et al. fail to disclose

- the light transmitting region disposed between an inner edge of a gate line and a side of outer edge periphery of the reflecting film in each pixel, a first opposing side of said reflecting film overlapping the greater part of an adjacent gate line, and a second opposing side of said reflecting film overlapping the greater part of an adjacent data line.
- a circular polarizer made of the cholesteric liquid crystal polarizer including a right handed helical cholesteric liquid crystal having a range of pitch values p of λ/n for electro-optical display images, where n is an average index of refraction of cholesteric liquid crystal and λ is wavelength. Since the display device is

conventionally worked or performed with the visible light, which has wavelength of λ=380nm-800nm.

Kim et al. teach (Fig. 6) a liquid crystal display device with the light transmitting region disposed between an inner edge of a gate line 17 and a side of outer edge periphery of the pixel electrode 104 in each pixel, a first opposing side of said pixel electrode overlapping the greater part of an adjacent gate line, and a second opposing side of pixel electrode overlapping the greater part of an adjacent data line for maximizing an aperture ratio, thus resulting high picture quality (paragraph 28 or 52). It is obvious to extend the reflective electrode in Fig. 21 of Kubo to overlap the greater part of an adjacent gate line and an adjacent data line for maximizing an aperture ratio, thus resulting high picture quality.

Faris teaches (col. 2 lines 54-64) a transmission-reflection type liquid crystal display device, wherein the circular polarizer includes a right handed helical cholesteric liquid crystal having a range of pitch values p of λ/n for electro-optical display images, where n is an average index of refraction of cholesteric liquid crystal and λ is wavelength λ=400nm-800nm (in range of 380-800nm) for replacing both ¼ wave plate and linear polarizer without absorbing photonic energy and producing heat (col. 3 lines 7-10) and high brightness (col. 4 lines 64-67). Besides the right handed helical cholesteric circular polarizer transmits the left-handed circular polarization component and reflects the right-handed circular polarization component.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a transmission-reflection type liquid crystal display device as Kubo et al. disclosed with (a) a first opposing side of said reflecting film substantially overlapping an adjacent gate line, and an outer peripheral edge of a second opposing side of said reflecting film substantially overlapping an adjacent data line for maximizing an aperture ratio, thus resulting high picture quality (paragraph 28 or 52) as taught by **Kim et al.**; (b) the circular polarizer includes a right handed helical cholesteric liquid crystal having a range of pitch values p of λ/n for electro-optical display images, where n is an average index of refraction of cholesteric liquid crystal and λ is wavelength λ=400nm-800nm (in range of 380-800nm) for replacing both ¼ wave plate and linear polarizer without absorbing photonic energy and producing heat (col. 3 lines 7-10) and high brightness (col. 4 lines 64-67) taught by Faris.

Claim 7-10 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo et al. (US6295109B1) in view of **Kim et al. (US2001/0046000A1)**.

In regard to claim 7, Kubo et al. teach (Figs. 21-22) a transmission-reflection type liquid crystal display device comprising

- a plurality of gate lines 53 and data lines 59a defining a plurality of pixels;
- a transistor in each pixel,
- a gate (gate electrode 52) of which is connected to a gate line and

- a second terminal (source electrode 59b) of which is connected to a data line;
- a reflecting film 61 **as functioning as a pixel electrode** formed in each pixel and connected to a third terminal (drain electrode 59c of the transistor in each pixel, an outer edge at a side of said reflecting film overlapping one of said gate lines substantially, while an outer edge at an opposing side of said reflecting film does not overlap an inner edge of an adjacent gate line,

wherein

- a light-transmitting region (region T) through which light may pass is disposed between one of said gate lines and said outer edge of said reflecting film, which does not overlap an inner edge of said adjacent gate line.

Claim 8:

- light-transmitting region (region T) exists between a data line adjacent to the data line connected to the second terminal of the transistor and the reflecting film in each pixel.

Claim 9:

- the reflecting film overlaps (not entirely) the data line connected to the second terminal of the transistor in each pixel as Fig. 8A shown.

Claim 10:

- the reflecting film overlaps (not entirely) a gate line adjacent to the gate line connected to the gate of the transistor in each pixel as Fig. 8A.

Claim 29:

- the reflection electrode 61 made of aluminum considers as the pixel electrode.

However, Kubo et al. fail to disclose the light transmitting region disposed between an inner edge of a gate line and a side of outer edge periphery of the reflecting film in each pixel, a first opposing side of said reflecting film overlapping the greater part of an adjacent gate line, and a second opposing side of said reflecting film overlapping the greater part of an adjacent data line.

Kim et al. teach (Fig. 6) a liquid crystal display device with the light transmitting region disposed between an inner edge of a gate line 17 and a side of outer edge periphery of the pixel electrode 104 in each pixel, a first opposing side of said pixel electrode overlapping the greater part of an adjacent gate line, and a second opposing side of pixel electrode overlapping the greater part of an adjacent data line for maximizing an aperture ratio, thus resulting high picture quality (paragraph 28 or 52). It is obvious to extend the reflective electrode in Fig. 21 of Kubo to overlap the greater part of an adjacent gate line and an adjacent data line for maximizing an aperture ratio, thus resulting high picture quality.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a transmission-reflection type liquid crystal display device as Kubo et al. disclosed with a first opposing side of said reflecting film overlapping the greater part of an adjacent gate line, and a second opposing side of said reflecting film overlapping the greater part of an adjacent data line

for maximizing an aperture ratio, thus resulting high picture quality (paragraph 28 or 52) as taught by Kim et al.

Response to Arguments

Applicant's arguments filed on 07/30/2007 have been fully considered but they are not persuasive.

Applicant's ONLY arguments are follows:

A Kubo does not disclose the transmissive pixel electrode 104 covers less than the greater part, i.e., less than half, of an adjacent gate line, and less than the greater part, e.g. less than half, of adjacent data line.

Examiner's responses to Applicants' ONLY arguments are follows:

A Kim (not Kubo) discloses the pixel electrode 104 covers the greater part of an adjacent gate line and an adjacent date line (see attachment). Therefore, it is obvious to modify the pixel electrode 81 (Fig. 21) of Kubo to overlap the greater part of an adjacent gate line and an adjacent data line for maximizing an aperture ratio, thus resulting high picture quality. In another word, examiner uses the fact that the pixel electrode overlapps the greater part of an adjacent gate line and an adjacent data line of Kim to modify the pixel electrode of Kubo for maximizing an aperture ratio due to wider display area regardless the pixel electrode is transparent or reflective.

Term "the greater part of" is not clarified how much to cover an adjacent gate line and an adjacent data line. "The greater part of" may interpret as not entirely or not completely. Terms "substantially" or ""the greater part of" is relative term, it can not quantity the amount of overlapping such as "more than or less than half". ONLY percentages will quantity the amount of overlapping.

The instant invention discloses (Fig. 4) the transmission-reflection type liquid crystal display device comprising

- the light transmissive region 9 is disposed between an outer edge periphery of the reflective pixel electrode 3 and an inner edge of data line 24, which is connected to the thin film transistor
- the light transmissive region 9 is disposed between an outer edge periphery of the reflective pixel electrode 3 and an inner edge of gate line 25, which is connected to the thin film transistor
- the reflection pixel electrode 3 covers entirely or completely the width of an adjacent gate line 25 which is not connected to the thin film transistor
- the reflection pixel electrode 3 covers entirely or completely the width of an adjacent data line 24 which is connected to the thin film transistor.

All these features are not cited in any independent claims.

Conclusion

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HOAN C. NGUYEN whose telephone number is (571) 272-2296. The examiner can normally be reached on MONDAY-THURSDAY:8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HOAN C. NGUYEN
Examiner
Art Unit 2871

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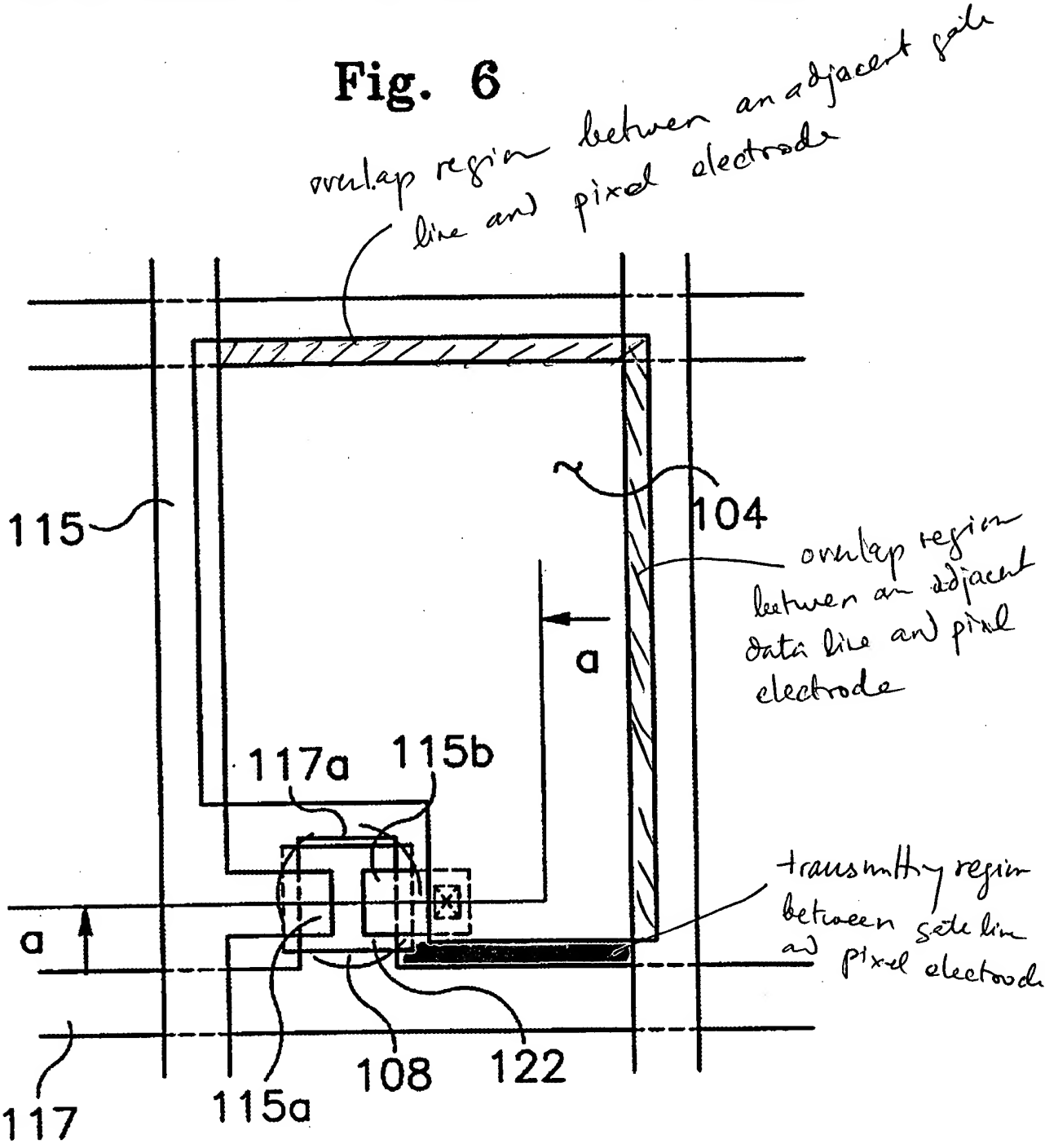
ANDREW SCHECHTER
PRIMARY EXAMINER

Fig. 6


overlap region between an adjacent gate line and pixel electrode
115
104
overlap region between an adjacent data line and pixel electrode
a
117a
115b
transmitting region between gate line and pixel electrode
a
117
115a
108
122